



## Taster Standardization in Instruction in Wine Testing and Assessment of Sensory Skills

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### ABSTRACT

All individuals possess genetic idiosyncrasies, most wine assessment is now done by jury in the panel consist from trained tasters. Like accredited laboratories, which determine analytical properties in protocol, also trained tasters, who have got certificate of the body, could give sensorial profile (protocol) of wine. It means, that well trained tasters could reliable determine sensory properties of wine products. This has required the preparation of more tasters and accredited organs, doing certification of bodies. Training of tasters must have standardization in the instructions, an extensive series of tastings of wines. In this work we trained 23 adepts on sensory skills of wine. Specific suggestions for appropriate wines with addition of: citric acid (sour taste) sacharose (sweet taste) and quinine (bitter taste) may be simulated like wine standards. Ten simply practical tasking tests were used. The sensitivity of taste, smell and colours or haziness in wine of assessors was described by objective set of tests duo-trio test, triangular test, paired comparison test, comparison tests. These lessons teach assessors and wine experts to distinguish between many tastes in white wine Gruner Veltliner and bitter taste in Blaufrankisch ispetially differentiate of threshold-minimum value of a sensory properties.

**Key words:** training of wine expert, certification of wine assessor, discrimination between tastes

Practical application: Applications of this research is in wine industrial or consumer world. Many people working in state control of Protected Designation of Origin (PDO/PGI) of wines after these exams are able to do independent analysis the sensory properties.

### 1. INTRODUCTION

Quality of wine tasters depends on training in regular cycle (5 years). In Slovakia there are the certification organs for certification of bodies who are able to assess wine, must and wine products. The certification process is in compliance with ISO 17024:2012 and STN ISO 6658:2010 [1-2]. Slovakian vitners, sommeliers and other wine experts judge and rate wines differently depending on where in the country they are located. Researchers in Canada found out that geographic location could affect how wine experts rate quality like balance and acidity of wine [3]. Therefore it is very useful to have standardization in certification process when we assess sensorial skills of people from all parts of Slovakia. Comparison of sensorial analytical results is very important to provide correct measurements between Degustators of wine and or assessment in judge and rate on wine competition [4]. Individual tasters can taste only a limited number of wines accurately. Each of us has our own unique hardware and software for tasting wine. The hardware is our sensory organs (seeing, smelling and tasting) and software is our psychological factors that affect our preferences over time [5]. The perceptive skill and ability to recognize odors on repeat exposure is poorly correlated with linguistic ability. In addition to correctly recognizing varietal odors also identification of odor faults is useful, therefore in the past faulty samples were obtained from wineries, but samples prepared in the laboratory are preferable [6]. For the quality of sensory analysis in certification of bodies is crucial the same conditions for all adepts and certification scheme [7]. The theoretical and practical parts of tests are in accordance with EU legislation and ISO norms [8]. Central Controlling and Testing Institute in Agriculture (CCTIA) in Bratislava makes twice a year the certification process for people who wants to know well distinguish threshold values between wine samples in the taste. They could achieve 2 levels: "Select Sensory assessment of wine" and "Sensory assessment wine expert". One of the evaluated criterion for giving certificate is fulfil theoretical test and/or practical test on 65%. You need not only qualified personal, who is

teaching and lead adepts though all 10 practical questions, but also manager of quality, who is responsible for handbook of quality, parameters of used wine, used chemicals, used place (see Fig.1) and used system of classification [9].



Fig. 1 Sensory laboratory.

## 2. MATERIALS AND METHODS

One of the key requirements in certification of bodies is certification scheme. The schema consist of specific technical instrumentation and procedure and is given in our Internal method IP č.1/08, 2013 [10]. It means names of teachers, managers, accurate instructions to prepare solutions, number of exams, express the solution of exams, classification and how to obtain certificate. We used Methods of selection described in ISO 8586- Part 1, 2,;2008 [11], in Practical part are used methods ISO 4120:2004, ISO 5495:2005, ISO 8587:2006, ISO 13300- Part 1,2: 2006 [12-15]. It was performed in accordance with local ethic guidelines. Study was reviewed and approved by the Central Control and Testing Institute in Agriculture.

We first make announcement about organizing this exams and after announce at least 20 people at our institution, we send invitations (see Fig.1) to the adepts by e-mail with study materials to prepare them for theoretical questions. After 2 weeks they come in good mood (it means without any illness) to make theoretical and practical tests. Testing begins at 9,00oclock in the morning with 20 theoretical task questions (maximal 10 points) in the quiet room (see ISO 8589:2006 [16]). After 20 minutes rest, we begin with the Practical test 10 Practical tasks were used with maximum 100 points which could be achieved. The used wine samples are usually white dry wines [17], not very aromatic so we use popular variety in Slovakia "Gruner Veltliner". The wine is characterised with total acidity 7 g/L, reducing sugars 2 g/L and volatile acids 0.30 g/L (which was measured in accredited laboratory). In these real wine addition of chemicals: sacharose p.a., tartaric acid p.a. for sweet and sour taste, then acetic acid p.a. for smelling acetate odor was added. As flavourful tannins exemplify best in red wines the variety "Frankovka modrá" (Blaufrankich) could be used and we added quininehydrochlorid (medical quality) to make the wine more bitter [18]. Milk (1.5 g/fat) and demineralized water after instructions was used for making different acuity or clarity. It means depending on the purpose of instructions, various skills are required in sensory analysis, whereas in quality evaluation, discrimination among subtle differences is more important. Wine-tasting technique require strict silence, absence of any distracting odors, and presentation of the wine in glasses [19].

### 1. Practical skill- assessing tasting sweet-sour-bitter taste in wine Gruner Veltliner

- Sample 1 with two added tastes: sweet and sour
- Sample 2 with three tastes: sweet, sour and bitter
- Sample 3 with one added taste: sour
- Sample 4 with taste: sour and bitter
- Sample 5 with two taste: sour and bitter

**Table -1 Assessing sour, sweet, bitter skill**

	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
Sour	x	x	x	x	x
Sweet	x	x			
Bitter		x		x	x

The duration of the finish 1 sample is from 5 seconds till 1 minute and after assessing 5 samples the expression is given to the teacher on the paper (see Table 1). Maximal score is 10 points.

## 2. Practical skill - triangle test for distinguish intensity of taste in wine

Wine samples with sweet taste was prepared as used white wine variety Gruner Veltliner with lower concentration 2 g/L of reducing sugars and used wine with addition of sacharose (5 g/L) so higher concentration is 7 g/L sugar.

Wine samples with sour taste was prepared as used white wine Gruner Veltliner with lower concentration 7 g/L total acids and used wine with addition of tartaric acid so that higher concentration is 7.5 g/L acidity. Standards of wines may be prepared and stored in 1L glass bottle in dark place is stable for three days.

Samples for bitter taste was prepared with lower concentration as is in used red wine Blaufrankisch and higher concentration is with addition of 0.005 g/L quininehydrochlorid to this wine. Standards of wines may be prepared and stored in 1 Litre glass bottles in dark place are stable for 3 days.

Three samples (with one taste which we say) are given in three glasses. In one time together they begin to taste. They know that in first triangle is sweet taste (6,7,8) and they should write on the paper which two have lower concentration and third higher concentration.

For example: Variant A for triangle combinations were:

Sample 6-lower sweet	Sample 9-lower sour	Sample 12-higher sour
Sample 7-lower sweet	Sample 10-higher sour	Sample 13-lower sour
Sample 8-higher sweet	Sample 11-higher sour	Sample 14-higher sour
Sample 15- lower sweet	Sample 18- lower sour	Sample 21-higher sweet
Sample 16-lower sweet	Sample 19- higher sour	Sample 22- lower sweet
Sample 17- higher sweet	Sample 20- lower sour	Sample 23- higher sweet

(In red wine)

Sample 24-higher bitternes

Sample 25-higher bitternes

Sample 26- lower bitternes

For mistake 1 point is taken down, for 1 triangle duration time is 3-4 minute. After assessing all 7 triangles, maximum 21 points could be given. The people could use water or dry pastry for neutralizing taste.

## 3. Paired comparison test- for differ intensity of taste in wine

Two samples were prepared for each taste- sweet, sour, bitter and concentrations are prepared like in second Practical skill. In one glass first sample 27 is given from the pair 27-28. All adepts together begin to degustate sample No 27. Then they pour out and wait, after 3 minutes they taste sample No 28 and compare this pair of white wine. They should distinguish which sample has higher and which lower concentration of taste (see Table 2). Test is time limited and discipline is requested.

**Table -2 Assessing pair comparison skills (Variant A for combinations)**

	Higher conc.	Lower conc.
Sweet	27	28
Sour	29	30
Sour	32	31
Sweet	33	34
Bitter	35	36

If they make mistake 2 points is taken out and duration for 1 sample is 90 seconds. After degustation of all 5 pairs maximum 10 points is given.

The rest for regeneration of sense is minimum 15 minutes. People eat bred or dry pastry and cheese.

## 4. Practical skill- distinguish between volatile acids odor

In contrast, critical tastings require strict silence and absence of any distracting odors. The acetic acid odors were prepared in the white wine Gruner Veltliner as is given in Table 3:

**Table -3 Assessing order skills**

Conc. Vol. acid	Sample
0.3g/L	41
0.5g/L	39
1g/L	38
1.5g/L	40
2.0g/L	37

Each adept should have all 5 glasses with samples, but samples are not given in right order and they should write positions of samples from lower concentration to the highest concentration of acetic odor (Tab.3). Swirling increases air-wine contact and tulip-shaped glasses are used. The temperature in the room not exceed 25°C. The duration for smelling 1 sample is 1min. (5samples 5 minutes) they could not taste it. It is 2 points for one sample (5 samples is maximum 10 points).

**5. Practical skill- distinguish the sour taste in wine (max. 5 points)**

**6. Practical skill-distinguish the sweet taste in wine (max .5 points)**

Each adept has got 5 glasses with samples Gruner Veltliner as follows:

Sample 42- used dry white wine	Sample 49- used dry white wine
Sample 43-wine+0,5g/L tartaric acid	Sample 48- wine +5g/L sacharose
Sample 46-wine+1g/L tartaric acid	Sample 47-wine +10g/L sacharose
Sample 45-wine+1,5g/L tartaric acid	Sample 51-wine +15g/L sacharose
Sample 44-wine+ 2,0g/L tartaric acid	Sample 55-wine +20g/L sacharose

The samples are given not in right order and they should determine taste and ranking from lower concentration to the higher concentration. For each good determination is 1 point and duration of finish is for 1 minute. For all 5 samples it is 5 minutes and maximum is 5 points for 5 samples.

After this small rest for regeneration must be done.

**7. Practical skill-Test of intensity the white wine colour**

**8. Practical skill-test of intensity the red wine colour**

**9. Practical skill- test of intensity haziness**

The two most significant features of wines colour are its hue and depth. Each adept has got 10 glass vials with wine. They were prepared as follows:

- The white wine Gruner Veltliner was pipetted in vials: 10.0mL – 9.5mL - 9.0mL – 8.5mL – 8.0mL – 7.5mL - 7.0mL – 6.5mL – 6.0mL and 5.5mL and vials were fill with distilled water to 10mL volume and mixed.
- The red wine Blaufrankisch was pipetted as follows in vials: 10.0mL- 9.5mL – 9.0mL – 8.5mL – 8.0mL – 7.5mL – 7.0mL – 6.5mL – 6.0mL and 5.5mL and are filled with distilled water to 10mL volume and mixed.
- Into clean 10ml vial 2,5ml of milk was pipetted and fill with water till 10ml. Then was pipetted from this solution in vials: 0.0mL-0.1mL-0.2mL-0.4mL-0.6mL-0.8mL-1.1mL-1.4mL-1.7mL and 2mL and volume was fill to 10mL with demineralised water and mixed.

Samples are given not in right order and they should give the order from the low intensity to the highest intensity of colour. Time of determination of one set (10 vials) is 5-6 minutes and maximum is 10 points for correct distinguish.

**10. Practical skill- distinguish between two white wine variety A and B.**

Wines are different in alcohol content, total acidity and extract without sugar. The variety A (for example Muller Thurgau) and B (for example Gruner Veltliner) after 1 minute tasting were poured out. Then 9 wine samples are given and adepts must put down on the paper which from it is variety A and or B variety. Maximum is 9 points.

### 3. RESULTS

Certification testing was for entered people very exciting. Interest parties have an interest in certification of clients (customers) of the organizations whose products of wine are certified. Since there is the threshold values of taste in the published contents in wine variety “Gruner Veltliner”, it seems possible that who pass this exam is suitable to determine the correct sensory impressions in taster panel. This results are in agreement with literature [20] and new information is contributed. This people are able to work as governmental authorities, but also consumers and other members of the public and are eager to have this certificate. Combination of many tastes and flavouring substances are native in wine [4]. Wine samples were without any fault and were fresh prepared in our laboratory (CCTIA). Adepts were good prepared for exams and very good results were achieved. From 23 adepts there were 3 people who have to come once more for certification (recertification), because they had only 53 points. 16 people manage to obtain “select sensory assessor” and had from 65-70 points. 4 people managed to be “Sensory assessor wine expert” with 80 points.

Example for one adept results is shown in Table 4.

**Table 4**

Name of practical skill	Maximum	Result
1	10	8
2	21	12
3	10	8
4	10	10
5	5	3
6	5	5
7	10	7
8	10	10
9	10	10
10	9	9
together	100	82

#### 4. CONCLUSION

The main task of Certification organ is on the base of request of applicant, official judge his competence to do sensorial evaluation of wine and wine products. It is obvious that the choice and performance of sensorial methods used in this exam was for people, who make wine quality characterization very exacting. It is many hours of training, to reach precise, accurate and reliable results of sensory analysis. People were from many famous wine factories or from state control organs and were very satisfactory with results. This certification testing aims to provide an independent assessment of the competence of the participants. People who wants to know well distinguish threshold values between wine samples in the taste, should have studying all the life.

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